the NIH Record

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

August 26, 1975
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NATIONAL INSTITUTES OF HEALTH

Dr. David Mathews is sworn in as HEW Secretary by Chief Justice Warren E. Burger as Mrs. Mathews holds the Bible, and President Ford and the Secretary's two daughters, Lucy and Lee Ann, watch the Aug. 8 ceremony in the HEW Auditorium.

Researchers Identify Genetic Factor Which Prevents Invasion of Human Blood Cells by a Malaria Parasite

NIH scientists have identified, for the first time, a genetic factor which prevents the invasion of human red blood cells by a monkey malaria parasite.

The unusual worldwide distribution of this factor—the Duffy negative red blood cell genotype—suggests that it may also be protecting certain human populations against one species of malaria.

Three Duffy genes determine the presence of Duffy a or b antigens on the surface of human red blood cells. The Duffy negative genotype—indicated by the failure of blood cells to react with antibodies to Duffy a or b antigens—is found in 90% of West Africans and 65% of Black Americans—groups known to be resistant to infection by the human malaria parasite, *Plasmodium vivax*. This genotype is extremely rare in racial groups susceptible to *P. vivax*.

Antigens Must Be Analyzed

This association between genotype and susceptibility suggests that Duffy antigens a and b may be the receptors on red blood cells which allow invasion by *P. vivax*. However, confirmation of this relationship must await the analysis of these antigens in Africans found to be infected with *P. vivax*.

Malaria is a daily threat to peo-

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Dr. Martin M. Cummings, Director of the National Library of Medicine, has been elected to the Institute of Medicine-National Academy of Sciences. The Institute was created in 1970 as a branch of NAS to enlist distinguished members of the medical and other professions in examining policy matters pertaining to the health of the public. This year's election raises the total active membership to 305.

CC Director Dr. Gordon Is Retiring From PHS

Dr. Robert S. Gordon, Jr., NIH Associate Director for Clinical Care and Director of the Clinical Center since January 1974, will retire Sept. 1.

He has been a member of the NIH staff and the PHS Commissioned Corps since 1951, serving first with the National Heart and Lung Institute and then as clinical director of the National Institute of Arthritis, Metabolism, and Digestive Diseases from 1964 until his appointment as CC Director.

Widely Known for Research

Dr. Gordon is recognized for his research on fat transport and metabolism in relation to presumed causes of arteriosclerosis. He is also widely known as the originator of the "PVP" for protein-losing gastroenteropathy.

He received a Stouffer Prize in 1972 for work on isolation of free fatty acids from plasma and demonstration of their origin, hormonal control, and importance as a source of energy.

He also received the PHS Meritorious Service Medal in 1970 for research on free fatty acids, helping to check a cholera epidemic in Pakistan, and outstanding leadership in administration of clinical research.

Dr. Gordon earned his M.D. degree at Harvard Medical School.

He has served on the HEW Career Service Board for Physicians, the National Advisory Committee for the Monell Chemical Senses

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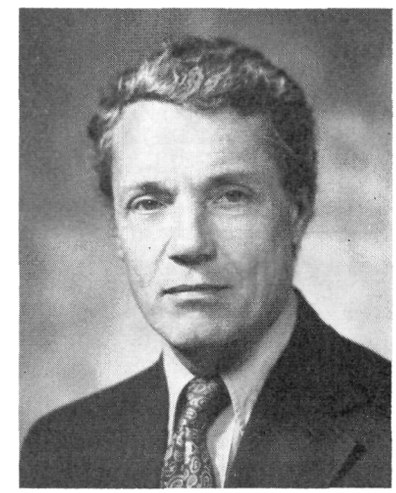
Dr. R. W. Lamont-Havers Cited For His 'Outstanding Service'

Dr. R. W. Lamont-Havers, NIH Deputy Director, received a special citation from HEW Secretary Caspar W. Weinberger "for outstanding service to the Department while serving as Acting Director of the National Institutes of Health."

The award was presented at the Secretary's farewell staff meeting.

Dr. Lamont-Havers was named NIH Acting Director in January 1975, and served in that role until Dr. Donald S. Fredrickson was sworn in on July 1.

Dr. Karl Piez to Speak On Collagen Structure At Mider Lecture in CC



Honors received by Dr. Piez include the DHEW Superior Service Award in 1966 and the T. Ducket Jones Memorial Award from the Helen Hay Whitney Foundation in 1970.

Dr. Karl A. Piez, National Institute of Dental Research, will deliver the next G. Burroughs Mider Lecture on Wednesday, Sept. 10, at 8:15 p.m. in the Masur Auditorium.

In his lecture on Collagen: Its Chemistry, Structure, and Function, Dr. Piez will discuss the composition and unique structure of this biological material which occurs in practically all tissues and is the major protein of skin, tendon, bone, and dentin of teeth.

Dr. Piez, who received his Ph.D. degree in biochemistry from Northwestern University, joined the NIDR staff in 1952. Since 1967 he has served as chief of the Dental Institute's Laboratory of Biochemistry.

Fosters Collagen Studies

He has been internationally recognized for his efforts in fostering correlative investigations concerning the biological role of collagen and other fibrous proteins in health and disease.

Also, Dr. Piez has served on the editorial board of the *Journal of Biological Chemistry*, and has con-

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3-Day Asian-American Program Will Feature The Cultural Heritage of Oriental Countries

A program entitled "Voices of Asian Americans" will be presented on Sept. 10, 11, and 12, at noon, in the Masur Auditorium. This is one of a series of EEO programs sponsored by the NIH Minority Cultural Committee.

The programs, which stress the cultural heritage of various ethnic groups through their art, music, and dance, also feature speakers who discuss the customs of other countries.

During the 3-day Asian-American program, demonstrations of oriental calligraphy will be shown, and dancing by Japanese, Korean, Vietnamese, East Indian, and Filipino groups will be given. Performers will also act out the traditional Chinese dragon dance.

The Reverend Andrew K. Whang, who was on the Asian-American Cultural Program last year, will again demonstrate ancient oriental instruments and explain their history and influence on Western music.

Dr. Sue to Speak

Speakers include Dr. Deral Sue, associate professor of psychology, University of California, and editor of the *Personnel and Guidance Journal;* NIH Director Dr. Donald S. Fredrickson, and Raymond J. Jackson, EEO chief.

Ban Put on Users of FTS For 50-Cent Phone Call

A "50-cent policy" change in the Federal Telecommunications System has been adopted at NIH effective Aug. 4.

Under the new policy, when a toll call is 50 cents or less for the initial 3 minutes, it must be placed over non-FTS facilities.

Some Calls Affected

Calls to non-Government telephones with the first three numbers and geographic locations listed are affected, and are now automatically blocked from completion over the FTS network.

Maryland 301
286—Clarksville, Md.
579—Brandywine, Md.
645—Waldorf, Md.
672—Odenton, Md.
674—Odenton, Md.
721—Crofton, Md.
743—Indian Head, Md.
748—Indian Head, Md.
782—Brandywine, Md.
Virginia 703
491—Woodbridge, Va.
494—Woodbridge, Va.
590—Dale City, Va.
670—Dale City, Va.
690—Lorton & Pohick, Va.

Official calls to these areas are placed over commercial facilities. The caller should dial "0," give the NIH telephone operator the area code and telephone number, and the operator will dial the call.

1975 Extramural Program Codes Are Now Available From DRG

The 1975 edition of *Program Codes, Organizational Codes, and Definitions Used in Extramural Programs* is now available.

The annual publication defines the NIH application grant and contract identification systems, codes used on applications, and award statements.

Copies are available from the chief of the Statistics and Analysis Branch, DRG, Westwood Bldg., Room 1A-03, Ext. 67561.

Quarantine Station in Facility on Campus To Receive Soviet Research Specimens

A series of conferences between NIH and the U.S. Department of Agriculture scientists and officials have resulted in the establishment of a quarantine station on the NIH campus to receive USSR research specimens.

Previously, USDA had banned the importing of certain research material from the Soviet Union including those specimens suspended in media containing fetal calf serum because the first shipment of that serum included 12 cell lines suspected of containing oncogenic agents. The lines were suspended in a nutrient containing the serum.

Dr. Kenneth R. Hook, Animal and Plant Health Inspection Service, USDA—the agency charged with protecting the health of U.S. livestock—declared that this medium may expose domestic animals to foot-and-mouth disease or other diseases.

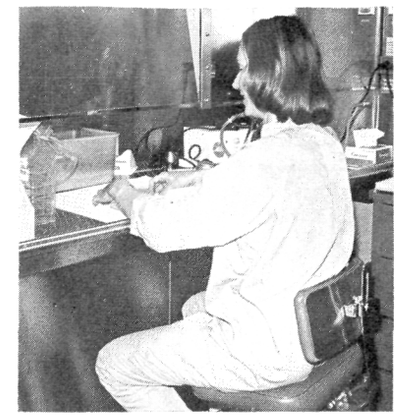
USDA regulates the importing of animals and animal products and other materials that might transmit livestock disease agents, particularly diseases not found in the U.S.

The exchange of research material, scientific information, and investigators started 4 years ago through a cooperative program between the U.S. and the USSR.

Dr. Manaker Heads Station

The quarantine station on the campus is under the direction of Dr. Robert A. Manaker, chief of the Viral Biology Branch, National Cancer Institute. The station is located in NCI's biohazard containment facility, Bldg. 41, Suite 100.

A similar USDA-approved quarantine station has been set up at Charles Pfizer and Company, Maywood, N.J.—an NCI contractor.



Marianne Oskarsson, NCI technician, prepares to test some imported specimens to determine whether they are free of agents hazardous to domestic animals.

Through the efforts of Dr. Earl C. Chamberlayne, National Institute of Allergy and Infectious Diseases, who also serves in the NIH Quarantine Permit Service Office, a series of meetings for people at NCI and USDA were initiated.

The two groups drew up a "memorandum of understanding and agreement" which established USDA-approved quarantine stations at NIH and at Charles Pfizer and Company.

USDA Supplies Antisera

The memo outlined the type of testing to be applied to the specimens and arranged for foot-and-mouth antisera, if needed, to be supplied by USDA's Plum Island Animal Disease Center, Greenport, Long Island.

Now, when a specimen arrives at NIH from the USSR, it is assigned either to NIH or Pfizer for testing.

Part of the material is tested for mycoplasmas by FDA. Also, two types of primary cultures and two types of cell cultures are inoculated to check for cytopathogenic effect. In addition, some of the material is inoculated into embryonated chicken eggs and into mice.

If there is no cytopathogenic effect, the cell cultures are examined by electron microscope for virus.

If all of these tests are negative, the specimens can be sent to those NCI contractors approved by USDA for *in vitro* studies. For *in vivo* studies of the foreign material, or for release to the general scientific community, samples must be tested for animal pathogens at Plum Island.

L. Earl Laurence, Clinical Center executive officer, presents farewell gifts to CC editorial assistant Nettie Burdette at her retirement party on July 23. Mrs. Burdette had been a member of the CC Office of Clinical Reports and Inquiries since 1954. Earlier, she had been with the NIH library for one year. One of Mrs. Burdette's important contributions was to prepare the proceedings of the NIH Combined Clinical Staff Conferences for publication in the "Annals of Internal Medicine."

The scientific man is the only person who has anything new to say and who does not know how to say it.—*Sir James M. Barrie*

Swedish, Switzerland Science Groups Offer Research Fellowships

The Swedish Medical Research Council and the Swiss National Science Foundation will each offer in 1976 three research fellowships to qualified biomedical scientists. These fellowships will provide postdoctoral training in basic or clinical medical research.

Requirements include evidence of aptitude in basic science or clinical research, and an interest in pursuing a research career in a health science field.

Applicants must also show that they have been accepted by a training institution and preceptor. It is the applicant's responsibility to arrange for research training with the preceptor, and to present in the application an explicit plan for research training.

The applicant's affiliation with the preceptor is documented in the facilities and commitment statement which must accompany each application.

Fellow, Family Given Fare

The fellowship must be started within 10 months of the date of its award; the time is set by mutual agreement of the applicant and the institution. Fellowships will normally extend for 12 months.

The fellowships provide for reimbursement of the cost of round trip tourist air fare tickets for the Fellow and family. Health insurance is provided during the term of the fellowship.

Stipends for the Swedish Medical Research Council Fellowships range for $10,000 to $13,600 per year, depending upon the number of years of postdoctoral research experience at the time of award.

The Swiss National Science Foundation stipends range from 24,288 Swiss francs ($9,533) to 30,624 Swiss francs ($11,627) depending upon the applicant's age at the time of award.

In addition, the Swiss National Science Foundation Fellowships provide 3,960 Swiss francs ($1,560) for the spouse and 1,200 Swiss francs ($470) for each child.

Research Workers, Apply!

Since the inception of these research fellowships, every year at least six U.S. scientists have been selected as fellows in the programs. The Fogarty International Center has suggested that young research workers at NIH apply as candidates for either fellowship.

Applications may be obtained from Dr. Eugene L. Walter, Jr., FIC, NIH, Bethesda, Md. 20014.

The deadline for receiving completed applications is Jan. 1, 1976. They will be reviewed for appropriateness and scientific merit at FIC and forwarded to Sweden or Switzerland for final selection and award in late Spring 1976.

All correspondence with FIC concerning these fellowships must be clearly marked as either "Swedish Medical Research Council Fellowship" or "Swiss National Science Foundation Fellowship."

Sally Linn—Perfect Secretary—Passes CPS Exam

On Oct. 7 Mrs. Linn will receive her CPS pin, certificate, and "lamp of learning" at the Bethesda chapter's annual Executive Function.

Administrators recognize that a good secretary is worth her weight in gold—for instance NIAMDD's Sally Linn, CPS—Certified Professional Secretary.

Mrs. Linn, secretary to Institute Director Dr. G. Donald Whedon, recently completed the demanding requirements of the Institute for Certifying Secretaries, of the National Secretaries Association.

The designation, CPS, signifies the fulfillment of a prescribed period of education, satisfactory secretarial experience, and the successful completion of a grueling 2-day comprehensive examination.

Certification is contingent upon the mastery of a curriculum including environmental relationships; business and public policy; economics and management; financial analysis and the mathematics of business; communications and decision making; as well as office procedures and precision skills.

"More and more colleges are giving equivalent credits for passing the CPS exam," Mrs. Linn noted. "Some will grant as many as 35 semester hours."

One of only 100 CPSs in Maryland and 8,813 nationwide, she shares her distinction with two other NIH employees: June Herman and Mary Elizabeth Dietterle, both of the National Heart and Lung Institute.

A member of the Bethesda Chapter of NSA since 1970, Mrs. Linn was selected its first "Secretary of the Year" in 1971.

Very active in NSA's Future Secretaries Association, she was instrumental in establishing the first FSA chapter in the Montgomery County school system at Albert Einstein High School, and personally sponsors a student chapter at Damascus High School.

She also serves as assistant FSA coordinator for the Delaware-Maryland-District of Columbia Division of NSA.

A member of the NIH Toastmasters Club, Mrs. Linn has addressed numerous area schools on the future of the secretarial profession.

"NSA believes that the principal obligation of a secretary is to function as a support to management and to increase the effectiveness of the executive," she says.

"Although we are now in an age where machines are increasingly replacing people, it is still people who run an organization.

"It takes people with a sense of responsibility to make any system work; therefore, the secretary is vitally important. And, machines don't smile, nor can you program tact or loyalty."

Fall Tennis Tournament Begins Sept. 10; Open to All Employees

The NIH Tennis Club fall tournament, which begins Wednesday, Sept. 10, is open to all Club members and NIH employees and their spouses.

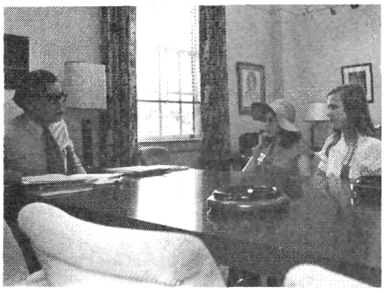
Players may sign up for men's singles, women's singles, and men's, women's, or mixed doubles.

A minimum of eight players or teams must be entered for formal play in a division.

Entry forms are available at the R&W office in Bldg. 31, and must be returned to that office no later than noon, Friday, Sept. 5.

There is a $2 entry fee for each event for all non-Tennis Club members.

Helen N. Mandich, a secretary in the Animal Resources Program, Division of Research Resources, receives an employee suggestion cash award from Richard L. Shafer, DRR administrative officer. Mrs. Mandich—the first DRR employee to receive this award—suggested modifying the deadlines for processing resource grant applications to allow additional time for review prior to study section meetings.



Dr. R. W. Lamont-Havers, NIH Deputy Director, discusses with two representatives from Girl's Nation some of the biomedical research that is conducted here; that organization was holding its convention in Washington, D.C. Carol Yates (l) from Mississippi was appointed honorary Director of NIH, and Carrie Coe from New Hampshire was named honorary NICHD Director for their day on campus.

USDA Graduate Program Schedules Fall Courses For Advancement or Fun

The U.S. Department of Agriculture Graduate School fall schedule of classes—including evening, daytime, and correspondence courses, as well as seminars and workshops—is now available.

Call 447-4419 to request a copy.

Courses are offered in such fields as accounting, editing, management, library techniques, secretarial skills, computer science, and personnel administration.

The Graduate School's curriculum, designed especially for Federal employees, covers Government operations at beginning through advanced levels.

For those wishing to take a course just for fun, interesting possibilities include: the home greenhouse, pottery, Chinese water color painting, stamp collecting, leaded stained glass, yoga, and pressed flower pictures.

Registration will be held Sept. 20-27 in the USDA Patio, 14th and Independence Ave., S.W., Washington, D.C. 20250.

Classes begin Sept. 29.

Sailing Assn. to Sponsor Course By Coast Guard; Starts Sept. 4

The NIH Sailing Association has invited Flotilla 7-10 of the U.S. Coast Guard Auxiliary to offer a 10-lesson course in boating skills and seamanship, starting Thursday, Sept. 4, at 7:30 p.m. in Bldg. 36, Room 1B-07.

Topics include legal requirements, rules of the road, charts and compasses, boat handling techniques, marlinespike seamanship, aids to navigation, weather, and marine communications — all emphasizing increased awareness of safe boating practices.

Attendance is limited to 30 people. Preregistration is at the Bldg. 31 R&W Activities Desk.

California Primate Center Studies Lungs' Adaptation, Immunity to Smog Damage

Lungs may be able to immunize themselves against moderate doses of photochemical smog, according to respiratory studies on monkeys and rodents at the California Primate Research Center, published in the July issue of *Federation Proceedings.*

The studies reveal that definite biochemical and structural damage takes place in the lungs of monkeys and rodents exposed to 0.2 parts per million of ozone for 8 hours a day on 7 consecutive days—typical ambient levels of ozone in parts of the South Coast Los Angeles Air Basin during the summer months.

However, the lungs in primates and rodents at the Center, which is supported by the Division of Research Resources, seem to adapt and physiologically recover within 90 days.

"It is highly likely that similar damage and adaptation can occur in human beings," says Dr. Donald L. Dungworth, principal investigator.

Permeability Affected

Photochemical smog, consisting of oxides of nitrogen, hydrocarbons, sunlight, and other oxidants, apparently oxidizes biological tissues and temporarily impairs the permeability of membranes, the researchers found.

Using specially constructed ozone exposure chambers to simulate photochemical smog, the investigators have concluded that adaptation is most successful at 0.5 ppm levels or below. Adaptation by rodents at 0.9 ozone concentration is unsuccessful; the effects worsen rather than diminish.

The mechanism of adaptation and the factors that either prevent or cause lung lesions in monkeys and rodents may be similar to those in human beings.

California's South Coast Basin area experiences some of the highest levels of photochemical smog in the Nation.

For example, from July 1 to Sept. 30, 1974, oxidant concentration of 0.2 ppm or greater occurred in the eastern portion of the Basin on 84 of the 92 days. A concentration of 0.5 ppm was encountered on 9 of these days; 0.8 ppm is an extremely rare occurrence.

People who are affected more by severe smog — those with chronic pulmonary diseases, such as bronchitis, emphysema, and asthma — not only have pulmonary insufficiency, but their capacity for adaptation is presumably lessened.

Increased levels of vitamin E intake may be one modifying factor in combating the harmful effects of high smog levels, the scientists have found.

Deficiencies of vitamin E in rodents increased the susceptibility of the lungs to damage by ozone during the study. Further vitamin E studies with rhesus and bonnet monkeys are planned at the Center.

Scanning electron micrographs from the California Primate Research Center, Davis, show (l) a section of the respiratory bronchiole in a normal rhesus monkey lung. These smallest airways in the lung are prime targets for the damaging effects of oxidant air pollutants. In a rhesus monkey exposed to 0.5 ppm of ozone, 8 hours a day for 1 week, (r) inflammatory cells and amorphous debris fill the alveolus and coat the airway surface. Immune defenses in the body will rectify this condition within 90 days despite continued exposure to lower photochemical smog levels. Persistent exposure to high smog levels may lead to chronic lung disease.

Security Specialist John J. Daly Retires after 17 Years at NIH

After more than 42 years of service in the investigative and law enforcement fields—17 of them at NIH—John J. Daly has retired as a security evaluation specialist in the Office of Protection and Safety Management, DAS.

He began his career with the government of the District of Columbia in 1933, coming to NIH in 1958 as a detective.

Here he was known to many employees for his investigative skill and his ability to handle delicate situations in a professional yet kind manner.

Mr. Daly was honored at a retirement luncheon by co-workers who presented him with luggage for his planned travels.

NIH Visiting Scientists Program Participants

7/30—Dr. Luigi Moro, Italy, Laboratory of Developmental Biology and Anomalies. Sponsor: Dr. George R. Martin, NIDR, Bg. 30, Rm. 416.

7/31—Dr. Emilio Itarte, Spain, Laboratory of Biomedical Sciences. Sponsor: Dr. Kuo-Ping Huang, NICHD, Bg. 6, Rm. 305.

8/1—Dr. Santo Landolfo, Italy, Laboratory of Immunodiagnosis. Sponsor: Dr. Ronald B. Herberman, NCI, Bg. 8, Rm. 118.

8/1—Dr. Angela Santoni, Italy, Drug Evaluation Branch. Sponsor: Dr. John Venditti, NCI, Blair Bg., Rm. 532B.

8/1 — Dr. Moshe Shani, Israel, Laboratory of Biology of Viruses. Sponsor: Dr. Norman Salzman, NIAID, Bg. 5, Rm. 324.

Visits Gerontology Center

8/3 — Dr. Se-kyung Oh, Korea, Laboratory of Cellular and Comparative Physiology. Sponsor: Dr. T. Makinodan, NIA, Gerontology Research Center, Baltimore.

8/5—Dr. Michael Bustin, Israel, Laboratory of Nutrition and Endocrinology. Sponsor: Dr. Robert Simpson, NIAMDD, Bg. 6, Rm. B138.

8/5—Dr. Adrian J. Ryan, Australia, Pharmacology Branch. Sponsor: Dr. John R. Bend, NIEHS, Research Triangle Park, N.C.

Travel Payments Change For Per Diem and Mileage

The new Travel Expenses Amendment Act of 1975, effective May 19, increases to $35 the maximum per diem allowance for travelers on Federal Government business.

The mileage reimbursement allowance for use of personal cars and planes was set at 15 cents a mile for automobiles and 22 cents a mile for aircraft.

Annual evaluations by the General Services Administration's Federal Supply Service will determine future equitability of these rates.

Provision has been made for automatic payment of "actual" expenses in designated "high rate" geographical areas. These areas and the maximum rate per day are:

Boston, $38; Chicago, $39; Los Angeles, $37; in New York City—Brooklyn and Queens, $39, Manhattan, Staten Island, and the Bronx, $50; San Francisco, $39; and Washington, D.C., $42. Montgomery County, Md. is not considered to be in the Washington, D.C. area.

For further information concerning these and other changes in travel regulations, contact Helen Donovan, chief of the Central Travel Section, Division of Administrative Services, Bldg. 31, Room B1-C38, Ext. 63441.

GENETIC FACTOR

(Continued from Page 1)

ple in Asia, Africa, and Latin America. This threat might be reduced if scientists could manipulate factors on the malaria parasite which prevent it from invading red blood cells. The invasion stage is essential for the continuation of the disease cycle.

The NIH researchers—Drs. Louis H. Miller, Steven J. Mason, and James A. Dvorak, Laboratory of Parasitic Diseases, NIAID, and Mary H. McGinniss and Dr. Ivan K. Rothman, Clinical Center Blood Bank—tested red blood cells from normal individuals for their susceptibility to invasion by the monkey parasite, *P. knowlesi.*

This parasite was used since scientists have not yet been able to grow the human parasite, *P. vivax,* under laboratory conditions.

Only Duffy negative cells resisted invasion by *P. knowlesi.* Observation of this phenomenon with a unique electro-optical system developed at NIH enabled the researchers to determine that the parasite attached itself to the Duffy negative cells, although it could not penetrate them.

Positive Cells Are Susceptible

Duffy positive cells (containing only a and/or b antigens) appeared to be equally susceptible to invasion by the parasite.

The NIH investigators found other evidence that the Duffy blood antigens are related to the susceptibility to malaria. Earlier studies by Dr. Miller and others had shown that treatment with certain enzymes—chymotrypsin and pronase — decreased the susceptibility of human red blood cells to invasion by *P. knowlesi.*

In the present investigations, the scientists showed that this effect is due to the enzymes' removal of Duffy a and b determinants from the cells.

Furthermore, blocking the Duffy a antigen with antibody directed specifically against this determinant greatly reduced the parasite's invasion rate.

Since it is now known that malaria parasites require specific receptors to invade human red blood cells, the parasite must therefore contain a corresponding group on its surface that attaches to these receptors. The isolation of this group on the parasite surface may facilitate malaria vaccine development.

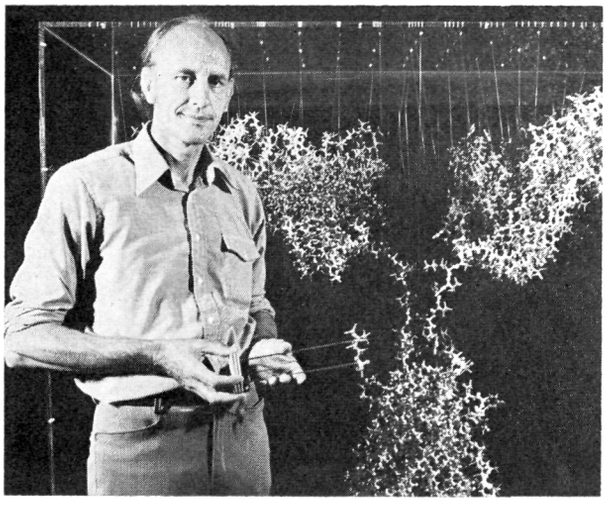
This research has been reported in the Aug. 15 issue of *Science.*

NIH Scientists Construct 3-Lobed Antibody Model Illustrating Sites Which Trap Foreign Substances

By helping to define the 3-dimensional structure and chemical make-up of antibodies—proteins critical in the body's defenses against bacteria, viruses, and other foreign substances—NIH scientists are contributing to an international effort that may eventually make possible the manufacture of artificial antibodies.

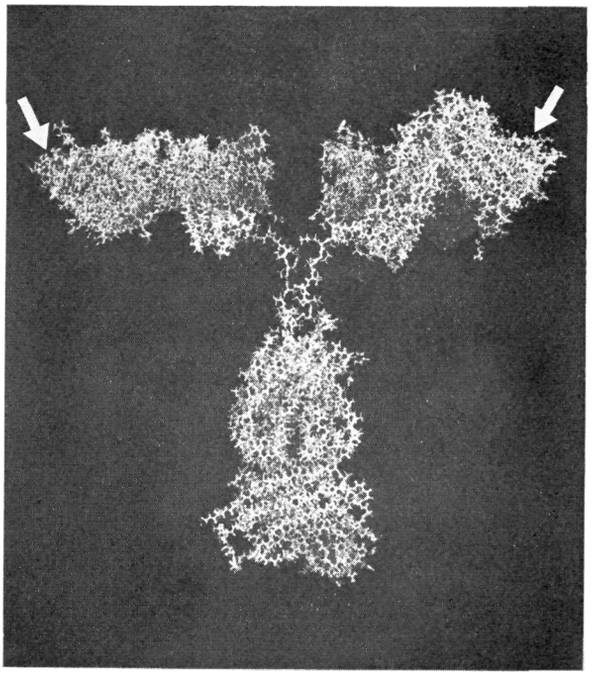
Other centers active in this research include the Max Planck Institute, Munich, Germany; the Argonne National Laboratory, Illinois, and the Johns Hopkins Medical School.

In the most recent *Annual Review of Biochemistry*, Drs. David R. Davies and Eduardo A. Padlan of the National Institute of Arthritis, Metabolism, and Digestive Diseases and Dr. David M. Segal, formerly of NIAMDD and now at the National Cancer Institute, describe X-ray crystallographic evidence of remarkable similarities in the complex structure of antibodies from humans and mice.



The 3-lobed antibody, at a scale of 1 cm to 1 angstrom (.00000001 cm), took several months to complete. Holding a model of the phosphorylcholine molecule that is trapped by this antibody, Dr. Davies stands next to the finished model, now on display in the Clinical Center lobby.

3-DIMENSIONAL STRUCTURE OF ANTIBODY



Arrows show part of antibody where haptens or antigens are trapped.

Long and Short Chains Can Pivot

The NIH findings are consistent with previous descriptions of antibodies, the proteins produced by certain white blood cells called plasma cells.

An antibody is a 3-lobed structure containing two short and two long chains of protein and hinged so that it can pivot from a taut T-shape to a forked Y.

The NIH scientists have found that the "business ends" of the antibody in trapping foreign substances are the distant ends of the T's crossbar and of the Y's upraised arms.

Their evidence came from a series of experiments on antibody fragments that trapped a foreign substance called phosphorylcholine in a cleft between the short and long chains at the outermost area of the T crossbar or the forked Y.

Chemically, the end portions vary from antibody to antibody in their protein building blocks or amino acids. This "hypervariability," pinpointed by Drs. T. T. Wu and Elvin Kabat at Columbia University in 1970, provides a molecular basis for binding to individual targets, or haptens, to immobilize them.

This past March, Drs. Padlan and Davies reported that the frequency of amino acid substitutions in various antibodies paralleled their structural variability.

In the current report they emphasize the striking similarities between human and rodent antibodies, and also note differences in the depth and width of the cleft in their "business ends."

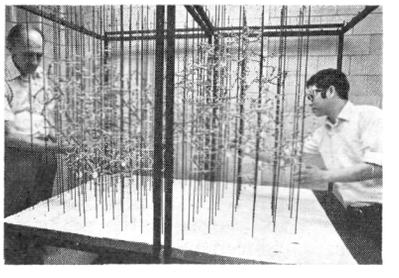
Drs. Segal, Padlan, and Davies analyzed the structure of the hapten-combining lobes of antibody by several techniques, including X-ray bombardment of crystals of antibody fragments, producing diffraction patterns which could be visualized on film.

Then heavy metal atoms which scatter X-rays were inserted into the crystals to make structural features more discernible.

By entering mathematical data on the spacing and position of the diffraction points into a computer at the Division of Computer Research and Technology, the investigators generated topographic maps (electron-density maps) of cross-sections of the hapten-binding antibody lobes.

The antibody's short or "light" chains were distinguishable from its longer, "heavy" chains. The manner in which they intertwine and fold upon one another could also be discerned.

The investigators then began construction of a 3-dimensional wire model illustrating the structure of antibody lobes that bind haptens and comparable larger molecules called antigens. The lobes are nicknamed Fabs, for Fragments, antigen-binding.



In their laboratory, Drs. Davies (l) and Padlan first constructed from X-ray data a model of the Fab portion of the ontibody at a scale of 2 cm to 1 angstrom.

To assure accuracy, the scientists used a half-silvered mirror, checking the Fab structure frequently against the topographic maps of the X-ray diffraction data.

One side of the mirror reflected the wire model; on the other, the topographic map was projected. Modifications in the placement or alignment of the wire sub-units representing individual amino acids were made whenever indicated.

The resulting 3-dimensional model is believed to represent in detail the basic structure of all antibodies.

Dr. Davies noted that the structural analysis would have been impossible without a source of crystallizable antibody. Most antibodies, produced by a variety of plasma cells, are heterogeneous and won't crystallize.

Dr. Michael Potter and colleagues in NCI solved this critical part of the puzzle by providing quantities of the unique, homogeneous antibody produced in plasma cell tumors of inbred mice.

Application to Myeloma Studies

Fragments of these antibodies, chiefly from the mouse tumor McPC-603 (McIntire plasmacytoma), are now known to have the same 3-dimensional structure as antibody fragments from patients with a related type of cancer, multiple myeloma.

This conclusion was dependent in part on information about the amino acid sequence of the McPC-603 antibody which was provided by NCI's Dr. Stuart Rudikoff and Dr. Potter.

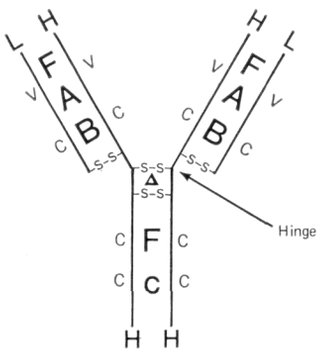
Dr. Davies and his colleagues also analyzed information on amino acid sequences of other crystallized antibodies and Fab fragments that had been published by non-NIH research teams.

Dr. Davies and associates found all of the amino acid sequences and their relative positions in the antibodies to be remarkably similar, except in regions that bind haptens.

The findings were also consistent with amino acid analyses of seg-

(See ANTIBODY MODEL, Page 6)

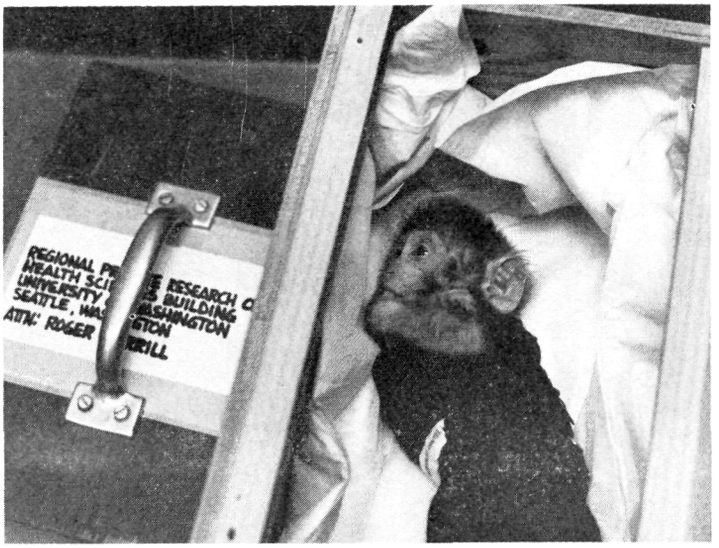
ANTIBODY STRUCTURE



The 3-lobed structure of antibody was first described by Dr. Rodney R. Porter of Oxford University in 1959. The structure consists of 2 Fabs (Fragments, antigen-binding) and an Fc (Fragment, crystalline) segment. For this research on structure, and evidence of antibody's 4 chains (2 light and 2 heavy chains), Dr. Porter shared a Nobel Prize in 1972 with Dr. Gerald M. Edelman of Rockefeller University.

Key:

Fab=Fragment, antigen binding
Fc=Fragment, crystalline
L=Light chain of antibody
H=Heavy chain of antibody
—S—S—=Interchain disulfide bridge
V=Variable region
C=Constant region



A WOOLEN MONKEY MITTEN with a battery-operated heating unit is being used by the Washington Regional Primate Research Center to transport baby research monkeys in unheated cargo sections of airplanes. Originally designed for hunters and outdoor sportsmen, the mitten works well to protect the infants, some born prematurely, during travel. The Center is supported by the Division of Research Resources.

ANTIBODY MODEL

(Continued from Page 5)

ments of three other mouse myeloma antibodies that had been described by Drs. Rudikoff and Potter in 1974.

The NIH scientists caution that the conclusions to date are drawn from only a few sources of antibody studied in crystalline form, not in the liquid state in which antibodies exist in the human body. Techniques for the analysis of soluble antibodies have not yet been developed.

Despite these limitations, the researchers consider that the recently acquired information is a major step toward greater understanding of antibodies' role in the body's immune defenses against various diseases.

The potential availability of synthetic antibodies, if they could be manufactured, would have a major impact on medical practice and the prospects for treating many human diseases.

Before-After School Program Starts for Children of NIH'ers

A before-and-after school program for children — in grades 1 through 6—of NIH employees will be given at the Ayrlawn Elementary School on Oakmont Avenue in Bethesda. That location is about one mile from the campus.

There will be two sessions: 7:30 to 9 a.m., and 3 to 6 p.m. The program starts Sept. 2, and runs throughout the school year including all holidays with the exception of Federal holidays.

The program, sponsored by the Parents of Preschoolers Inc., will include such activities as arts and crafts, music, field trips, and the use of the school library. Refreshments will also be provided.

For further information about the program and fees contact Virginia Burke, NIH child care coordinator, Bldg. 31, Room 2B-30, Ext. 61811.

University of Chicago Grantees Develop Virus-Induced Brain Tumor Animal Model

University of Chicago neurologists have produced a new type of virus-induced experimental brain tumor in rats, described as one of the best animal models to date of the most common human brain tumor, glioblastoma.

Like similar human brain tumors, the rat brain tumors were large, invasive, and hemorrhagic.

Kirsten murine sarcoma virus—one of the oncornaviruses or oncogenic RNA viruses that cause cancer in animals and, presumably, in human beings—was discovered by Dr. Werner H. Kirsten, professor and chairman of pathology and professor of pediatrics at the University of Chicago.

Tumor Virus Established

Sarcomas are a type of cancer. Murine, from the Latin *mus*, refers to mice. Ki-MSV produces cancers in rats as well as mice, and other types of cancers in addition to sarcomas.

For study purposes, the rat brain cancers induced by the Kirsten virus are superior to other animal-model brain tumors. The method developed at the University of Chicago not only produces brain tumors in 100 percent of the rats, but, unlike other experimental brain tumors, they closely resemble the most common type of brain tumors.

Characteristics of the rat tumors were described in a paper before the American Association of Neuropathology by Dr. Nathan K. Blank, resident in neurology at the university.

Wai-Kwan Yung, a senior medical student, and Dr. Nicholas A. Vick, former associate professor in the department of neurology, were co-authors.

Their research was supported by grants from the National Cancer Institute and the National Institute of Neurological and Communicative Disorders and Stroke.

This project is an example of research being done on cancer at the University of Chicago, a component of the Illinois Cancer Council, which is a consortium of institutions comprising one of the Nation's Comprehensive Cancer Centers.

Some of the features of the model rat brain tumors, as described by Dr. Blank are:

The large hemorrhagic tumors were composed of cancerous primitive-type glial cell precursors and mature astrocytes. Glial cells are one type of nerve cells; astrocytes are a type of glial cell.

In the rat tumors there was an abnormal proliferation of blood channels of two types:

- Small capillaries had a particularly rapid increase, apparently cancerous, in the endothelial cells lining the blood vessels' walls. Inspection under the electron microscope showed numerous small gaps through which blood plasma proteins leaked into the brain.
- In addition, abnormal blood-bearing channels, devoid of the normal blood vessel lining—endothelium—were formed by the invading astrocytes.

The University of Chicago team is now making detailed studies of the new experimental brain cancers, experimental cancers induced in rats by other means, and autopsy specimens of human brain cancers to learn what features are common to all glioblastomas and the mechanism that causes them.

Drs. Gullino and Taylor Named to Breast Cancer Task Force Posts, NCI

Dr. Alan Rabson, director of the National Cancer Institute's Division of Cancer Biology and Diagnosis, recently announced the appointments of Dr. Pietro M. Gullino as chairman of the Breast Cancer Task Force and Dr. D. Jane Taylor as executive secretary.

The Breast Cancer Task Force was established in 1966 to coordinate research on all aspects of breast cancer. It also supports research on breast cancer. The task force is organized in four committees: experimental biology, epidemiology, diagnosis, and treatment.

Dr. Gullino had been chairman of the task force's experimental biology committee. Dr. Taylor was executive secretary of that committee and, since early 1975, acting executive secretary for the task force.

Dr. Gullino joined NCI in 1957 as a visiting scientist. From 1959-1968 he was a pathologist in the Laboratory of Biochemistry. He then became head of the Tumor Physiopathology Section. In 1973 this section became the Laboratory of Pathophysiology with Dr. Gullino as chief of that laboratory.

Dr. Gullino is a graduate of the University of Turin, Italy, where he received his M.D. degree.

Dr. Taylor joined NIH in 1947 as a parasitologist in the Laboratory of Tropical Disease. Later, that laboratory became part of the National Institute of Allergy and Infectious Diseases.

Joined NCI in 1958

From 1958-1961 she served in the Endocrinology Section of NCI's Cancer Chemotherapy National Service Center—now the drug research and development program in the Division of Cancer Treatment. During 1961-1973 she was head of the Endocrine-Related Tumor Section.

In 1973 she was appointed head of the Experimental Biology Projects Section in the Division of Cancer Biology and Diagnosis. She became chief of the Breast Cancer Program Coordinating Branch this past June.

Dr. Taylor received a B.A. degree from Rice University, an M.S. degree from Iowa State University, and her Ph.D. in biology from George Washington University.

NIEHS Grantees Analyze Home Repair Materials, Reveal Exposure Danger

Analysis of representative samples of spackling, patching, and taping compounds by National Institute of Environmental Health Sciences grantees shows that some contain asbestos minerals as well as other potentially harmful substances.

Beware of Materials

Measurements suggest that home repair or construction work involving use of such materials may result in exposure to dust at concentrations sufficient to produce disease.

Details of these findings appear in the Aug. 15 issue of *Science*.

Workers exposed to asbestos face a greatly increased risk of developing lung cancer, mesothelioma (a rare form of cancer), cancers of the gastrointestinal tract, and asbestosis (a scarring of the lungs).

These effects generally do not show up until 2 or 3—and sometimes even 4—decades after the first exposure to asbestos.

Compounds Described

Recently, Drs. A. N. Rohl, A. M. Langer, I. J. Selikoff, and W. J. Nicholson, at the Mount Sinai School of Medicine, analyzed 15 samples of consumer spackling and patching compounds and 10 industrial drywall taping compounds for asbestos mineral content.

Spackling and drywall taping compounds consist of finely-grained white powder or premixed pastes. Although plaster of Paris is supposedly the major constituent, other light-colored materials—including clays, micas, quartz, talc, and ground limestone — supplement or replace the plaster in many formulations.

In addition, chrysotile asbestos is added to some products, apparently because these minute fibers act as reinforcing agents.

Analysis of the 15 consumer spackling and patching samples has shown that 5 contained appreciable amounts of chrysotile or other asbestos minerals, as did 9 of the 10 industrial products. Many contained substantial amounts of quartz, talc, and other minerals.

Air Samples Analyzed

Once embedded in the lungs, quartz or silica particles — like those of asbestos — may never be removed. They can produce chronic obstructive and fibrotic diseases after prolonged exposure. Talc can also produce pulmonary fibrosis.

Air samples obtained during the use of asbestos-containing spackle compounds were analyzed and frequently showed concentrations in excess of the occupational standard for asbestos exposure levels.

Fiber counts measured during mixing, for example, were found to be 7-12 times greater than the standard.

Detectable fiber concentrations were found in adjacent rooms during mixing, and fibers were still suspended in the room air at least 15 minutes after mixing had ceased.

"These findings suggest the possibility of significant asbestos exposure during home construction and repair," said Dr. David P. Rall, NIEHS Director.

"Additional work by the scientists suggests that members of the entire household or other occupants of a building may also inhale asbestos fibers. This could occur during mixing, sanding, or cleaning up of debris," he explained.

Ruth Metka, chief of the CC Outpatient Nursing Service since 1964, recently retired. Ms. Metka, who joined the Clinical Center in 1953 as a nurse supervisor, received a PHS commendation medal in 1972 for her skill in managing a complex and expanding nursing service.

DR. PIEZ

(Continued from Page 1)

tributed to the Gordon Research Conferences on proteins.

His extensive writings on polypeptide chain organization, the biochemical mechanisms of covalent cross-linking in collagen, and his development of new chromatographic and analytical techniques have provided the base for much of the present knowledge of this protein and its variation in disease processes.

Lecture Honors Dr. Mider

The G. Burroughs Mider Lectureship was established in 1968 by the scientific directors to honor Dr. Mider for his distinguished service to NIH.

The Lectureship is awarded by the NIH Director, on the advice of the scientific directors, to a scientist who has contributed significantly to biomedical research at NIH.

Serum With Hepatitis B Antibodies Protects Against Disease But May Interfere With Natural Immunity

The preliminary results from two recently completed clinical trials indicate that serum gamma globulin preparations rich in antibodies against hepatitis B confer effective temporary protection against the disease. However, in some subjects, these preparations may also interfere with acquiring natural immunity.

These clinical trials were supported by the Division of Blood Diseases and Resources of the National Heart and Lung Institute.

In one trial 712 medical workers and laboratory personnel who had been accidentally exposed to hepatitis B infections participated.

In the other there were 614 participants who were recently admitted patients or recently hired employees at renal dialysis units, where there is greater-than-normal risk of such exposure.

Three preparations were tested in each of the two clinical trials.

The first preparation was normal human gamma globulin containing plasma proteins—antibodies—which are produced after exposure to antigens. These last substances are introduced into the body by infectious organisms or other antigen-containing "foreign" substances.

This "control" gamma globulin preparation contained only a low level of antibodies against hepatitis B antigens.

The other two preparations were from donors who had been previously exposed to hepatitis B and whose gamma globulin fractions contained either intermediate or high levels of antibodies against hepatitis B antigens.

Hospital employees who were accidentally exposed to hepatitis B each received 3 ml of one of the three gamma globulins within a week after exposure and the same injection again after one month.

Among those receiving normal gamma globulins, the incidence of hepatitis (the clinical disease or the elevated blood levels of hepatitis B antigen) was 7 percent.

Those receiving preparations of gamma globulin intermediate in preformed antibodies against hepatitis B did not fare significantly better. But those receiving preparations high in hepatitis B antibodies experienced only a 2 percent incidence.

The patients and employees of the dialysis centers received an initial dose of 3 ml of one of the three gamma globulin preparations initially, then a similar dose after 4 months.

Again the incidence of hepatitis and/or elevated blood levels of hepatitis B antigen was similar among those receiving normal gamma globulin preparations or receiving preparations containing intermediate antibody levels (21.3 and 23.1 percent respectively).

Again those receiving gamma globulin preparations high in antibodies against hepatitis B fared better than the other groups.

The results indicate that significant degrees of temporary protection against hepatitis B infections are conferred by gamma globulin fractions high in antibodies against hepatitis B during followup periods up to 8 months.

Later on, however, some of the recipients of the high-titer gamma globulin fractions developed hepatitis or elevated levels of hepatitis B antigens.

The results suggest that the protection against hepatitis conferred by antibody-rich gamma globulins is temporary and may, in fact, impede the development of "natural" immunity sometimes resulting from one or more exposures to the hepatitis B antigen.

The results of this study were reported at the July meeting of the International Society of Blood Transfusion in Helsinki.

The principal investigators were Dr. Alfred Prince, of the New York Blood Center in New York City, and Dr. George F. Grady, of Tufts University and the Massachusetts Department of Public Health.

EHS Shows 'Fat Fighters' Film Here on Aug. 27, 28

"The Fat Fighters" emphasizes objectivity, commitment, and improving one's self image.

One need not be overweight to profit from this 20-minute film, shown by the Employee Health Service in Wilson Hall, Bldg. 1 on Wednesday, Aug. 27, and in Conference Room D, Westwood Bldg. on Thursday, Aug. 28, at 11:45 a.m. and 12:30 p.m. on both days.

Beverely R. Bright, in the Office of Administrative Management, NHLI, receives two certificates and a letter of commendation from Dr. Robert L. Ringler, NHLI deputy director, and other bond drive officials in recognition of her effectiveness in the recently concluded campaign.

NCI Report Comparing Survival of Black, White Cancer Patients Issued

The report on a study citing differences in survival rates from cancer between white and Black patients has been released by the National Cancer Institute.

The report—*Treatment and Survival Patterns for Black and White Cancer Patients Diagnosed 1955 through 1964*—cites generally lower survival rates among Black patients as compared to white patients.

The study included 219,493 white and 21,088 Black patients whose cancers were diagnosed between 1955 and 1964 in selected hospitals in the United States.

The NCI scientists found that cancers of the digestive tract, reproductive organs, and bladder were diagnosed at a localized stage more often in the white patients than in the Black patients.

Black-white differences with respect to the extent of the disease at diagnosis were less apparent for cancers of the pancreas, lung, kidney, and brain, which are more difficult to detect at an early stage.

Cancers diagnosed when localized to the site of origin often are treated more successfully than are more advanced cancers.

100 Hospitals Included

The editors of the report, Lillian M. Axtell, Dr. Max H. Myers, and Evelyn M. Shambaugh, of NCI's End Results Section, said that the 100 hospitals in the study represented a selection of cancer treatment facilities from general hospitals to university-based urban hospitals.

Included in the study were all hospitals in Connecticut; hospitals which treat approximately one-third of cancer cases diagnosed in California; a group of hospitals in the Boston metropolitan area, and six large university hospitals in various parts of the U.S.

Results of the study suggest that whites use modern screening and diagnostic techniques more frequently than Blacks. This pattern may be due in part to socioeconomic, cultural, and perhaps other as-yet-unidentified factors, the scientists explained.

Rates for Early Diagnosis

Survival rates generally were lower among the black patients even when their disease was diagnosed at a localized stage. This difference was greatest among patients with bladder cancer and among females with cancer of the body of the uterus.

However, for cancers of the kidney, survival was more favorable among Black patients than white patients.

Single copies of the report are available free of charge from the Office of Cancer Communications, NCI, Bethesda, Md. 20014. Multiple copies can be ordered for 75 cents each from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NIH Researchers, Grantees to Present Papers At World Congress on Pain Research, Therapy

The First World Congress on Pain Research and Therapy will be held in Florence, Italy, on Sept. 5-8. About 650 scientists, physicians, and other health practitioners from many countries will attend the Congress, which is under the auspices of the newly organized International Association for the Study of Pain.

NIH will be represented at the Congress by scientists and scientist-administrators; several will present papers on their research.

NIH grantees will present 50 of the 250 scientific papers to be given at concurrent sessions during the 4-day meeting.

The National Institute of Dental Research and the National Institute of General Medical Sciences are among the co-sponsors of the Congress.

Organized a year ago, the IASP will have its first election of officers at this meeting. Dr. John J. Bonica, director of the University of Washington's pain clinic and chairman of the university's department of anesthesiology, has been chairman of the IASP governing council and of the organizing committee. Dr. Bonica is an NIH grantee.

At the opening plenary session, Dr. Ronald Dubner, chief of the Neurobiology and Anesthesiology Branch, NIDR, will give an address on pain pathways related to the trigeminal system.

Dr. Edward Driscoll, chief of the Anesthesiology Section of NIDR's Neurobiology and Anesthesiology Branch, will co-chair a session at which three other members of the Branch—Drs. Ralph E. Beitel, Stephen Gobel, and Donald D. Price—will present papers related to their work on trigeminal pain.

Dr. Aaron Ganz, chief of NIDR's Pain Control and Behavioral Studies Program, will co-chair sessions on the trigeminal system and on the taxonomy of pain.

Other Participants Listed

Dr. Emilie Black, deputy director of Clinical and Physiological Sciences, NIGMS, will co-chair a session on peripheral blocks and pain control.

The National Institute of Neurological and Communicative Disorders and Stroke will be represented by Drs. Ta-Chuan Chen and Choh-Luh Li.

Dr. Chen, head of the Section on Mathematical Statistics, Office of Biometry and Epidemiology, will discuss inherent problems and approaches to developing a pain data center. Dr. Li, associate neurosurgeon, Office of the Clinical Director, will present a critique on psychogenic pain.

Helen Neal, NIH Office of Communications, is chairman and Vivian Dobson, NIGMS, is vice chairman of the committee for public information.

DR. GORDON

(Continued from Page 1)

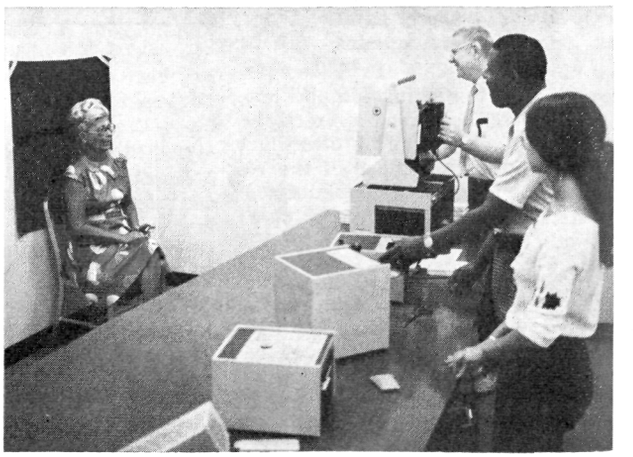
Dr. Gordon—who served as a leader in clinical care and hospital administration during his CC tenure—also guided specific research programs conducted by the Digestive Diseases Branch, NIAMDD.

Center in Philadelphia, and the editorial board of the *Journal of Lipid Research.*

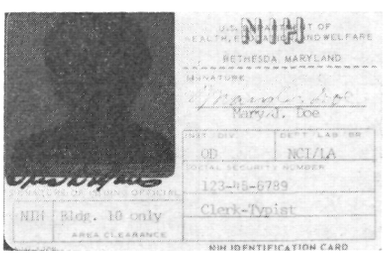
He has also held several advisory positions for NIH cholera research programs.

Dr. Gordon will become a visiting professor in the Department of Social and Preventive Medicine at the University of Maryland, and at the same time will undertake advanced training at the Johns Hopkins University School of Hygiene and Public Health.

Dr. and Mrs. Gordon plan to maintain their home in this area.



Sample Identification Card



Identification cards are currently being made for all NIH employees. By mid-September the project will cover approximately 11,000 persons by building and by B/I/D. Employees of BHM-HRA recently took the necessary few minutes for the procedure. Ted Bell (l) receives a typed card to sign. Jimmie Wenige smiles for a quick Polaroid portrait, then waits a minute or two for processing and sealing of the card in plastic. Ralph Stork, chief of the Protection and Parking Branch, DAS, says the cards will help increase security by making possible quick differentiations between bona fide employees and unauthorized persons in the area.

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